16

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CANCER OF THE STOMACH.*

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The fundamental factor in the etiology of cancer still eludes the careful investigator, is still a mystery. A fuller knowledge of the essence of life seems essential before we can read its inner pathology. However, with an army of enthusiastic and patient workers in the field, and with ever-increasing facilities, we should take courage. And, too, when we consider the yield of knowledge in other fields long resistant we are not without hope that in time this great mystery may also be solved and dread cancer will be a matter of history.

Much practical knowledge concerning cancer of the stomach has been gained from clinical and surgical methods, and much has been achieved through laboratory research. Some of the predisposing conditions are so clearly outlined that even now we can point out radical lines of treatment and may attack the disease in the precancerous state, thus circumventing the dread scourge and, through prevention, reach the heights of modern medicine.

Back in the late nineties we were impressed by the long precancerous histories of many of our patients. This precancerous history was that of ulcer and often covered a period of years (typically chronic ulcer), until finally malignancy developed, symptoms changed and signal danger approached. The percentage in long histories

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has not held so high of late as in earlier years, though it still averages about 50%. But what has better strengthened our position that ulcer is the great and fertile soil of cancer have been the pathological findings during the past four or five years. However satisfactory a long history may be, we have demonstrated that it is not necessary in order to establish the fact that ulcer precedes cancer. Indeed, some of our shortest histories have proven to be those where cancer has been implanted on a previously non-malignant ulcer base. Proof of this fact is obvious. We know that ulcers are often latent for years and are first recognized when bleeding, perforation, obstruction or cancerous degeneration becomes manifest. When cancer attacks one of these latent ulcers, great inroads may be made before symptoms other than the loss of flesh and strength are felt. Sudden obstruction from new growths and paralysis of the stomach wall may develop, motor power disappear, rapid loss of flesh follow and death result within a few weeks. These cases have but a short manifest history, but the real condition remains the same and the precancerous soil may have existed months or years.

In all the partial resections of the stomach made for cancer and microscopically examined during the years 1906–7, and until June, 1908, in St. Mary's Hospital, we have been able to demonstrate a precancerous or non-malignant ulcer state in 62% of the cases. Some of these have long, some short, histories. Among the long histories some can, others cannot, be demonstrated positively as cancer on ulcer, but the period of complaint argues against cancer being present during the whole term of illness.

Before passing to the general symptoms refer-

able to the stomach, I desire to point out and to emphasize the diagnostic significance of the picture of carcinoma of the stomach as seen in the facies of such patients. The face of a patient suffering from cancer of the stomach has certain morbid characteristics. Pallor is often most noticeable about the eyes, nose and mouth. Wasting, too, shows here, giving a pinched, wrinkled look. The expression is one of stolidity; there is intense conviction of impending danger, and while the patient is intent, as though eager, to read your opinion, the expression is not so much pained as hopeless, calm and dejected. One may often diagnose cancer of the stomach with reasonable certainty by a glance at the face of the sufferer.

When cancer has once fastened itself upon the stomach, the course is, as a rule, steadily and surely downward, with rare intervals of freedom from its ravages. The patient loses weight and strength more rapidly than is consistent with lessened appetite; a weakness, loss of desire to do active work, and a feeling of weariness control. Anemia usually develops rapidly. There is a dull, sickening, indescribable pain; or perhaps only a strange distress which is not always closely related to food, is often continuous, and with it a mental depression and consciousness of pending evil. This mental attitude seems to be the special factor which gives to the facies that expression which marks the sufferer with malignant trouble and points out the diagnosis. This factor, coupled with languor and emaciation, leaves but few other diseases to be considered.

In eliciting the history of gastric cancer we find three types. First, those with a long series of repeated attacks which are clearly those of ulcer, the so-called " precancerous state." This is the

typical chronic ulcer period. Second, those in which the initial symptoms were more or less severe, but where months or years of quiet intervened before the malignant symptoms appeared. Third, those in which the acute symptoms suddenly attack the patient in the midst of apparent perfect health.

In the first and second types the precancerous history is that of ulcer; that the precursor in the third type is very often ulcer is being determined through surgery and skillful pathological technic. In this latter group it is more than probable that the early history has been overlooked, or, because of the present increased distress, the patient thinks that the earlier disturbance is not worth considering. From conclusions based on the many histories taken at our clinic, we would distinguish four stages in gastric ulcer development and would expect cancer when it did develop to appear in the third or fourth stage, or often to be the fourth.

In the first stage of ulcer there is an unusually good appetite, with nutrition at par or even excessive; pain two to five hours after meals, when the stomach is empty or emptying itself; the heartier the meal, the longer and more complete is the sense of stomach satisfaction (overactive digestion); perhaps some gas and sour eructations; occasional vomiting of small amounts of sour, bitter liquid; excess of hydrochloric acid; stomach normal as to position and size. These patients present themselves to be relieved of pain, which they say comes on after meals, but which in reality is pre-meal pain.

The second stage, we may say, begins some months later, following several intermissions with recurrences, each recurrence increasing more or less in severity. The appetite is good, though

perhaps not above normal; less satisfaction follows the hearty meal, pain is severe and comes sooner after taking food. Distress or discomfort may be present even when so-called "pain" is absent; gas is usually complained of; sour eructations are common; vomiting of sour, bitter, acrid fluid at times mixed with food is frequent. A sense of relief follows vomiting for a greater or less period. Loss of flesh is noted during the attack either from voluntary or prescribed dieting, though rapid gain takes place during the intermissions. There is perhaps some dilatation, and acidity is high or normal. During the third stage a desire for food may remain; the desire may be fair or decreasing, but the patient will be afraid to eat because of the distress — pain, gas, vomiting, sour eructations, bloating or sour burning stomach — which may follow. There will be but a short period of food relief. Obstructive symptoms, loss of flesh and even cachexia may be present. Constipation, marked in all stages, is usually obstinate here. The stomach may be dilated and prolapsed, hydrochloric acid normal, lessened, or even absent. Blood may be found during any stage at a test meal, but more frequently during this stage than previously because, other conditions being equal, the chemical and mechanical powers of the stomach are such that blood destruction (digestion) is retarded.

It is extremely difficult to mark the distinctive period of the transition of the third stage, which is ulcer, into the fourth stage, which may be cancer, so imperceptibly does the change take place.

Some patients are weak, emaciated and even cachectic, with ulcer the only lesion, (1) if the motor power of the stomach be greatly interfered with, or (2) if the lesion is large and the destruction great even in the presence of mild obstruction.

Here a transition may begin, and although all possible diagnostic means and precautions are taken, a differentiation cannot always be made before widespread degeneration removes all hope of cure. But when the clinician is awakened to his important task, he will at least reach the point of honest suspicion and call surgery to his aid. Many times one does find symptoms that offer a basis for differentiation. Pyrosis increases in amount, but is less acute; or rather, not a pyrosis, but an irregular regurgitation of a less acid fluid. As in ulcer, on stooping, or during the night, fluid which has more or less acidity pours from the stomach and may awaken the patient. This regurgitation is more copious, but usually much less acid, than in ulcer. Gas and bloating with a distended discomfort increase. Nausea and vomiting are more often excited by liquid food. Appetite may persist quite to the end, but as a rule it gradually lessens until finally the patient may turn from food with distaste. Nervousness and languor are combined; weakness and faintness creep on; the patient's ability to exert himself decreases rapidly; anemia may come speedily and the flesh waste decidedly. A languid air, a paleness about the eyes, nose and mouth, associated with a pinched expression (atoxemic look), are common. All these conditions point directly to a transition. The character of the pain changes; it is dull, sickening, more wearing, more continuous and not so regular in the recurrence of severer pain. The severer attacks come at unexpected times, sooner after food, as a rule, and are not so acute. There is more relief from eructations of gas and vomiting because the depression is deeper. The pain is more diffuse and not so often eased by pressure or position.

Localization of pain, though not always definite

in ulcer, is much less so in cancer. As in ulcer, if perforation has taken place, there may be a wide field of radiation, otherwise the epigastrium is the seat of pain. As cancer progresses, diffuseness of pain increases. The diagnosis must, however, be made in the absence of pain. Tenderness is also frequently absent.

Vomiting, always a prominent symptom, usually intensifies as malignancy creeps on. It becomes more irregular, longer between attacks, and is more copious unless there be contraction from diffuse infiltration. The vomitus is rancid, often acid and obnoxious, foul. All of these symptoms vary in intensity according to obstruction and destruction, but the chief characteristic of cancer vomiting is that food taken into the stomach several hours or even days before, returns poorly macerated and with undigested masses in it, and this even when pyloric obstruction is not marked (cancer paralysis).

Vomiting is, as a rule, accompanied with less retching in cancer than in ulcer; blood is more frequently seen, while bile is a rarer accompaniment. If there has been a long period between the ulcer symptoms and the recent cancerous change (Type 2), the diagnosis is usually easier because of the constancy, the rapid approach and marked character of the symptoms. There may be a short but persistent period of flatulency, bloating, lessened appetite and loss of flesh; then, as is so often marked in Type 3, the sudden burst of malignancy that clinicians say attacks the patient in the height of good health. In these two types we most often find tumor, and in many other respects they are so similar that we should be led to consider them counterparts, the early symptoms in the one being overlooked or forgotten by the otherwise healthy individual. Motor power

lessens rapidly as cancer progresses, and if the pyloric obstruction is acute and the other symptoms intense, dilatation advances rapidly. Organic acids increase, hydrochloric acid decreases and blood is more often and more easily detected. Finally, it is the composite pathological picture that the patient presents at the clinic quite as often as the symptoms he urges upon you that fixes the period when the benign has yielded to the malignant condition.

When we reach the undoubted fourth stage (cancerous), the whole picture intensifies. The appetite is poor or absent; even the smell of food may be repulsive. Meats and fats are especially avoided. Emaciation follows rapidly, often faster than can be accounted for by loss of appetite (toxic or perhaps food delay). Strength fails rapidly, languor is intense and the patient exerts himself with difficulty. The anemic-cachectic condition develops more and more clearly; the body becomes emaciated, the skin dry, wrinkled, and at times lemon-yellow. Pain increases and is more constant, boring and undermining; it is less acute, but more sickening. Food, if tolerated at all, almost immediately increases the pain. There is frequent vomiting of quantities of poorly macerated and undigested food, rancid and offensive, and of coffee-ground color. Blood is more constant and more easily detected because of the further decreased or absent motor power; sour stomach, eructations and gas become distressing. Obstinate constipation, mental depression, extreme languor, cachexia, prolapse, dilatation, tumor, lactic acid fermentation, absence of hydrochloric acid — when these conditions prevail, the diagnosis can scarcely remain doubtful.

The picture of cancer where no obtainable precancerous symptoms are elicited, or where a long

period has elapsed since symptoms are recalled, is closely that of the latest stage of those with long-preceding ulcer history, except there is usually less acute pain, or none; tenderness more often absent, tumor oftener present, depression and weariness more marked and the general downward course more violent. These are the cases of whom you say, when they enter the office, "This is cancer of the stomach, and tumor will be found." Here one must be prepared to make a diagnosis in the presence of few symptoms, the facies and the general pathological picture presented by the patient bearing out the meager clinical findings.

Differential diagnosis. — This is a broad and difficult field to cover, and too often we find that we are not within the limits of precision. I shall consider but two small groups of diseases, one non-surgical and the other surgical.

(I) Of the non-surgical diseases, syphilis, tuberculosis, Bright's disease and pernicious anemia only will be briefly discussed. Syphilis, when it attacks the liver or stomach, may closely simulate ulcer or gallstones, and when quite advanced, the pain, cachexia and vomiting may lead to a strong suspicion of cancer of the stomach. The history of specific infection, the sudden attacks of pain and vomiting (crises), their almost abrupt cessation after a more or less prolonged period, together with shooting pains of a general character, cause the diagnostician to hesitate. Anti-syphilitic treatment often aids to clear up the diagnosis.

Many patients with tuberculosis will present themselves with a diagnosis of stomach trouble, not a few of them fearing cancer. Anorexia, food pain, vomiting, emaciation, cachexia are present; hydrochloric acid may be absent. A careful examination reveals irregular fever, cough, bacilli, lung complications or other tubercular foci, and

the clinician should not remain long in doubt concerning the correct diagnosis.

Bright's disease will often confuse the physician. Loss of appetite, emaciation, anemia, vomiting and stomach analysis will closely follow the cancer type of stomach trouble. Repeated examinations of the urine may be necessary; history of increased frequency is often given. These, together with the condition of the heart and blood vessels, will usually clear up the diagnosis.

The most important condition, that is, the most important to differentiate, is that of pernicious anemia. Unless the blood findings are positive, one is often at a loss in deciding. There may be lack of appetite in both. Dyspeptic symptoms, but not the dislike for food, go with anemia; usually we do not find the pain and vomiting of cancer. In cancer and anemia there may be pain, shortness of breath and palpitation on exertion, but in anemia these symptoms are much more clearly defined. Rest gives perfect physical ease in anemia, while in cancer the stomach distress and general weakness do not yield completely to quiet. There is less emaciation in anemia, the skin is more apt to be lemon color than colorless, there is an oilier "feel" present and a slight edema is usually found. Stomach analyses in pernicious anemia are misleading, and if seriously considered, many mistaken diagnoses may be credited to them. Absence of hydrochloric acid and presence of blood are frequent conditions in both. The examination of the blood is invaluable. Poikilocytosis is common in anemia and infrequent in cancer. In anemia the hemaglobin is low, red count low, and color index high. In cancer, hemaglobin test is frequently high, due to dehydration of blood, and the color index is not above normal, usually low. Staining the blood

and the discovery of the distinctive nucleated red cells of anemia will usually establish the diagnosis. The facial expression is of value. In anemia there is a general paleness and icteric tinge, not the excessive paleness about the eyes and nose. There is a slight puffiness of the tissues and a more hopeful expression; emaciation is less marked, and the wrinkled condition which in cancer adds so much to the picture of cachexia is wanting.

(II) The surgical conditions considered are (1) gall bladder disease with adhesions, infections, duct obstruction or pancreatitis; (2) large ulcers; (3) saddle ulcers; (4) hour-glass stomach; (5) pyloric ulcers with prolonged histories where obstruction, perforation or adhesions have developed.

Chronic gall bladder disease with complications certainly gives serious trouble in differentiation. Late in the illness the stomach symptoms are so typical of grave ulcer or cancer that we are forced to serious consideration. Our hope of differentiation lies in the early history, where if the trouble be in the gall bladder, we find the typical history of sudden, severe, irregular epigastric attacks, with pain radiating to the right arch and to the back; upward pressure (bursting feel) spasm of the diaphragm; abrupt cessation after a longer or shorter attack. There is no relation to food; there may be jaundice. This early history will often clear up the diagnosis between ulcer and gallstones and lessen the chances of making the diagnosis of malignant stomach.

Often in the malignant list, or seriously so considered, are patients suffering from large ulcerous lesions. This is true when the destruction is great, loss of blood evident, anemia marked, food intake greatly reduced; emaciation pro-

nounced and where there is vomiting of large amounts, perhaps coffee-ground in character.

This same picture prevails in many saddle ulcers, in hour-glass stomachs and among the long histories where at a late period obstruction, perforation, adhesions and deformities have developed. In any of these histories we may find anorexia, emaciation, hemorrhage by stomach (coffee ground) or bowel, vomiting, cachexia, absence of hydrochloric acid, presence of lactic acid, Oppler-Boas bacilli, with all the signs of motor insufficiency which is often so marked in cancer.

In cancer, loss of appetite comes early; loss of strength and flesh progresses rapidly and is too marked to be accounted for by time and lessened appetite. This loss of strength is often the first symptom complained of. In ulcer the appetite remains until late, and fear of pain is very often the cause of lessened food intake. Loss of flesh and strength is slow and well accounted for by the forced abstinence. Pain in cancer is more diffuse, more constant, not so closely related to food and is more depressing. Nausea and vomiting are more irregular and take place when no food is present. In ulcer the vomiting comes at the height of pain and is usually due to food. In cancer, vomiting of blood is more frequent, not so copious, and is often altered by detention in the stomach. Hydrochloric acid is often absent; Oppler-Boas bacilli and lactic acid present. A tumor is frequently palpable. One may almost surely diagnose cancer when a movable tumor of the stomach is demonstrated and which on expiration may be prevented from ascending.

The satisfaction that may follow an exact diagnosis does not justify us in prolonged observation. The chief factor to be considered is, what we owe the sufferer. All of this latter group of condi-

tions is purely surgical, and a careful surgical diagnosis being made, we should urge our patients to accept this as reasonable and advise rational treatment. The surgeon who is up to the present-day technic may be trusted to find and correct the existing pathologic condition.

The treatment of carcinoma of the stomach is either palliative or radical, palliative only when the diagnosis is so delayed that hope of surgical aid is lost, or in case operation is refused. Surgery offers the only means of cure and should be advised in all cases when (1) the diagnosis is made early enough, (2) the location of the cancer makes the case an operable one, and (3) when the promise of relief or cure is likely to yield returns for the suffering, danger and expense to be borne by the patient. In no other disease is the responsibility of the medical attendant greater, and no measures should be left untried to secure an early, accurate diagnosis. It is sometimes said that the cures from operative procedure are so few in cancer of the stomach, the relief given so small and prolongation of life so little that we are not justified in putting our patients into the surgeon's hands. This may be true (1) if the cancer is diffuse or the distant glands infected, so that removal is beyond hope. This cannot always be absolutely determined before operation, so we must act on the possibility of doing something positive. (2) If the diagnosis is not made until tumor, cachexia and all positive symptoms appear, then we should know that the distant parts are invaded and the case beyond the surgeon's aid. (3) It is also quite as true that if we cannot turn our patients to a surgeon who has mastered present-day technic, that we might better leave them to palliative treatment. But there are scores of surgeons in

this country to whom we may trust our patients with the utmost confidence that the right thing will be done despite any error that may have been made in the diagnosis. There are, on the other hand, scores and scores of men who have not learned in the proper school of experience, and to whom we should not turn even a simple case of appendicitis, "as soon as the diagnosis has been made." In the ranks of the latter is a great multitude of self-styled surgeons who are continually at war with the internist, criticising his methods, his failures in diagnosis and his hesitancy in turning over to the surgeon any cases he may have in charge. It is this class of "knockers" that is doing the most to delay the proper and close alliance between the progressive internist and the conservative surgeon.

We certainly have a problem before us. Not one for the medical man alone; not one for the surgeon only, but one that calls for the best combined efforts of surgeon and internist.

The problem is to evolve a method of *early diagnosis in cancer of the stomach,* so that the sufferer may be offered a chance of cure. The horizon is gradually widening. Good has come and is coming yet more rapidly through earlier diagnosis and competent surgery. The near future promises much. In cancer of the stomach the internist must concern himself with but one thing — early diagnosis. That which the surgeon must demand to-day, that which enters almost solely into his promise of cure, and that alone which places him beyond merely an operator, is accurate and early diagnosis. There is but one thing for which the patient should return real gratitude to his physician, and that is for an early diagnosis.

When a definite diagnosis or a strong suspicion

of cancer exists, there is known to-day but one line of treatment to follow or advise. Surgery alone offers hope of amelioration or cure. It is our imperative duty as internists and surgeons to see that the patient gets the best that is available in diagnosis as well as techinc.

STATISTICS GATHERED AND COMPILED BY DR. DONALD GUTHRIE.

There have been 191 resections for cancer of the stomach in St. Mary's Hospital, Rochester, Minn. Twenty of these resections have been made since the beginning of 1908 and are excluded as valueless in the way of statistics. The cases previous to 1903 are not included because of want of sufficient data concerning them. One patient in this early series is known to have lived four years, and one is alive and well to-day, a period of ten years.

From 1903 to 1908, there were 126 cases. Number of males, 88. Number of females, 38. Average age of male and female, 51. Average age of males, 52. Average age of females, 49. Age of patients under 30, 4. Age of patients over 70, 6. The ages of the remaining 116 ranged from 30 to 70 years.

Number deceased, 78, or 61%. Number living, 42, or 33.5%. Questionable, 6.

Number that lived less than 6 months,	14
" " " " " 1 year,	14
" " " between 1 and 2 years,	16
" " " " 2 " 3 "	10
" " " " 3 " 4 "	2
" " " over 4 years,	2
	58
Died in hospital,	14
Dead, time unknown,	6
Total dead,	78

Number alive 6 months to 1 year,	11
,, ,, 1–2 years,	9
,, ,, 2–3 ,,	14
,, ,, 3–4 ,,	4
,, ,, 4–5 ,,	3
,, ,, over 5 years,	1
Total number living,	42